



Gamified Mobile Learning to Enhance Vocabulary Acquisition and Speaking Fluency among Secondary EFL Students

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Abstract: Research on mobile-assisted language learning has underscored its potential to enrich vocabulary development and provide flexible oral practice, yet evidence remains limited on how gamified mobile ecosystems shape the intertwined advancement of lexical command and fluent speech among secondary English as a Foreign Language (EFL) learners. This study explored how a structured gamified mobile learning intervention addressed these gaps by embedding progress quests, time-bound speaking missions, and reward-based vocabulary tasks into instructional routines. Employing a quasi-experimental pretest-posttest design, data were gathered from 122 students selected through intact class sampling across Grade 8, utilizing a receptive and productive vocabulary test and a rubric-based speaking fluency assessment administered before and after the intervention. Additional data were obtained from a closed-ended questionnaire capturing learner engagement patterns and a structured interview with selected participants to explore task experiences in greater depth. The results revealed meaningful expansion in vocabulary repertoire and more sustained spoken delivery, while several learners demonstrated inconsistent pacing, reduced stamina during extended tasks, and difficulty transferring practiced items into spontaneous conversation. These divergent outcomes suggest that gamified mobile learning can enhance lexical retrieval and oral participation, yet its effectiveness depends on calibrated task design that minimizes mechanical participation and fluctuating speech performance.

Keywords: EFL, Gamification, Mobile-assisted Learning, Secondary Students, Vocabulary Acquisition.

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Introduction

Vocabulary acquisition and speaking fluency are central learning outcomes in secondary EFL education because learners need both lexical command and sustained oral delivery to participate in meaningful communication. Gamified approaches have gained substantial visibility in technology-enhanced language learning research, with studies highlighting their potential to stimulate sustained engagement, repeated participation, and deeper interaction with target language input ([Erdiana et al., 2025](#); [Ferdiansyah et al., 2025](#); [Romsy et al., 2024](#)). For English as a Foreign Language (EFL) learners, game elements such as quests, points, leaderboards, and time-bound challenges have been shown to heighten learners' willingness to practice and increase the frequency of exposure to vocabulary and oral tasks, creating conditions that support lexical consolidation and speech automatization ([Slamet et al., 2024b, 2024a](#); [Slamet & Basthomi, 2024](#); [Widodo et al., 2025](#)). Despite these advantages, the literature also reveals that engagement fostered through gamification does not consistently translate into improved linguistic outcomes. Several investigations report that learners sometimes prioritize goal completion over meaningful linguistic processing, resulting in superficial participation that limits vocabulary retention and reduces the quality of oral output ([Basthomi et al., 2025](#); [Ikhwan et al., 2025](#); [Slamet et al., 2025b, 2025a](#)). These findings indicate a critical need to examine how game dynamics shape cognitive engagement and whether motivational features genuinely facilitate measurable gains in vocabulary and spoken fluency rather than merely increasing participation.

Parallel research on mobile-assisted vocabulary learning demonstrates that multimodal input, spaced repetition, and immediate feedback can strengthen receptive and productive lexical knowledge ([Cancino & Viguera, 2024](#); [Fithriani, 2021](#); [Gao & Pan, 2023](#)). However, many studies isolate vocabulary outcomes from oral performance, preventing a comprehensive understanding of how mobile learning supports the integration of lexical retrieval with real-time speech production for EFL learners ([Afshar & Jamshidi, 2022](#); [Farhane, 2025](#); [Hanafiah et al., 2022](#)). Evidence regarding spoken fluency is similarly fragmented. While mobile tasks have shown potential to improve speech rate and reduce hesitation in controlled contexts, several studies note inconsistent effects during spontaneous communication, suggesting that lexical learning does not automatically transfer to fluent connected speech ([Alimorad & Saleki, 2022](#); [Hanafiah et al., 2022](#); [Yang et al., 2024](#)). Furthermore, most research treats vocabulary and fluency as separate constructs, overlooking psycholinguistic perspectives that emphasize their interdependence during speech formulation. These limitations underscore the need for research that examines how gamified

mobile tasks simultaneously influence vocabulary acquisition and spoken fluency, particularly through mechanisms that integrate retrieval practice, speech planning, and real-time oral performance for EFL learners.

Vocabulary acquisition demands precise operationalization that accounts for receptive recognition, productive retrieval, depth of semantic and collocational knowledge, and the ability to mobilize lexical items during spontaneous communication. Although scholars consistently highlight vocabulary as a foundational component of fluency development (Avila & Fonseca, 2021; Samortin, 2020), many studies continue to measure lexical gains through narrow indicators such as raw word counts or surface-level accuracy ratios, which overlook how learners internalize and manipulate vocabulary in real-time interactions in an EFL context. Spoken fluency, similarly, involves a multifaceted construct that integrates temporal features, pausing behavior, repair patterns, and the smooth orchestration of connected speech (Gao & Pan, 2023; Permata et al., 2024). Yet prior research often isolates individual features without examining how lexical access supports or constrains fluency processing. This narrow focus limits understanding of how mobile and gamified learning environments mediate the reciprocal relationship between vocabulary resources and fluent speech production, an intersection increasingly emphasized in psycholinguistic and technology-enhanced language learning research for EFL learners (Fan & Wang, 2025; Liu, 2024).

Taken together, gaps persist regarding the integrated effects of gamified mobile learning on both vocabulary acquisition and spoken fluency, the mechanisms by which game-based features shape linguistic performance, the specificity of construct operationalization, and the limited scope of prior measurements that overlook dynamic interactions between lexical retrieval and fluent speech. These gaps provide a rationale for examining how a structured gamified mobile learning intervention supports learners' vocabulary growth and fluency development, and how learners navigate cognitive, motivational, and linguistic demands embedded in game-driven tasks.

Literature Review

Gamified Mobile Learning in Language Education

Gamified mobile learning has gained increasing attention as researchers seek to understand how digital platforms enriched with game mechanics can support sustained language development. In the EFL context, studies consistently emphasize that mobile applications provide portability, immediate feedback, multisensory input, and frequent interaction, all of

which are conducive to language practice (Avila & Fonseca, 2021; Cancino & Viguera, 2024). When augmented with game elements such as levels, quests, reward systems, and performance challenges, these environments tend to heighten engagement and persistence (Fan & Wang, 2025; Hanafiah et al., 2022). However, the literature indicates that elevated engagement does not automatically translate into deeper language learning outcomes. Several studies report that learners may focus on point accumulation rather than cognitive investment, resulting in superficial participation and inconsistent transfer of language skills to real communicative contexts (Fithriani, 2021; Liu, 2024; Slamet & Basthomi, 2024). In addition, research often isolates engagement and motivation as endpoints without explaining how game dynamics facilitate specific linguistic processes. These gaps highlight the need to further examine the mechanisms through which gamified mobile features influence measurable language skills, particularly when tasks demand lexical retrieval and performance under time constraints for EFL learners. Evidence on multimedia games also indicates that game-supported learning may strengthen affective engagement when interest and motivation are explicitly designed into the task cycle (Ghanbaran et al., 2015).

Vocabulary Acquisition in Digital and Gamified Environments

Vocabulary acquisition remains central to second language proficiency, yet studies using digital tools frequently emphasize breadth over depth of word knowledge. Research shows that mobile learning platforms can strengthen recognition and recall through spaced repetition, audiovisual cues, and contextualized microlearning (Cancino & Viguera, 2024; Gao & Pan, 2023). In the EFL context, gamified vocabulary activities, including timed quizzes and badge-awarded mastery cycles, can reinforce repetition and encourage learners to revisit challenging items (Avila & Fonseca, 2021; Cancino & Viguera, 2024). Despite these advantages, existing studies tend to operationalize vocabulary growth using limited metrics that overlook nuanced dimensions such as collocational accuracy, form-meaning connections, and productive retrieval in real-time speaking. Furthermore, the literature seldom investigates how vocabulary gains achieved within gamified systems translate to spontaneous or semi-spontaneous oral communication (Fithriani, 2021; Permata et al., 2024; Samortin, 2020). Such gaps indicate that vocabulary learning should be examined as both a cognitive and performance-based construct to capture a more complete picture of learners' lexical development within gamified mobile EFL contexts. Ghanbaran and Ketabi (2014) further emphasize that multimedia games can support vocabulary learning through both incidental

exposure and intentional lexical practice, which aligns with the present study's integration of recognition, recall, and speaking-based retrieval.

Speaking Fluency Development in Technology-Mediated Learning

Speaking fluency research increasingly acknowledges the multifaceted nature of fluent performance, involving speed, pause management, repair patterns, and connected speech features (Elverici, 2023; Gkomtzia, 2024). Technology-mediated tools, including mobile applications and voice-based tasks, have been found to create low-pressure environments that encourage rehearsal and repeated attempts, potentially strengthening fluency through iterative production (Köroğlu, 2021; Mohzana, 2024). Gamified speaking tasks, such as timed missions or performance streaks, may further stimulate learners to produce speech under conditions that approximate real communicative demands (Pituxcoosuvann et al., 2024; Wong & Yunus, 2023; Yang et al., 2024). However, in the EFL context, the literature notes mixed outcomes. Some learners achieve smoother delivery with reduced hesitations, while others exhibit task-induced stress, uneven pacing, or overly memorized performances that do not necessarily reflect authentic fluency (Yin & Chen, 2024). Existing studies often emphasize frequency of speaking practice rather than analyzing how gamified constraints shape cognitive load, real-time monitoring, and long-term fluency shaping. These inconsistencies suggest the need for research that explores how speaking fluency develops when mobile platforms incorporate both motivational and performance-driven mechanics for EFL learners.

Theoretical Framework and the Study Context

This study is grounded in usage-based gamification (Landers, 2014) and socioconstructivist perspectives (Foo & Hussain, 2010), which view language development as emerging through repeated meaningful encounters with input, frequent retrieval of linguistic forms, and authentic communicative use supported by interactional demands and contextual cues. Gamified mobile learning operates as an enabling environment where cognitive engagement, emotional investment, and behavioral participation converge to facilitate vocabulary consolidation and fluent oral production. Within this framework, the study was situated in a private secondary school in East Java, Indonesia, a context characterized by diverse learner proficiency levels, varied digital experiences, and a curriculum that prioritizes communicative competence. The school's reliable access to mobile devices, structured English instruction, and administrative encouragement for technology-aided learning created

optimal conditions for examining how gamified tasks function across heterogeneous learner profiles. These contextual features allow the findings to offer meaningful insights for comparable EFL institutions seeking to strengthen vocabulary development and enhance spoken fluency through structured mobile-based gamified activities that integrate repeated exposure, retrieval practice, and real-time oral performance.

This study is guided by the following two research questions (RQs):

1. How does gamified mobile learning influence learners' vocabulary acquisition as reflected in receptive and productive lexical performance?
2. How does gamified mobile learning affect learners' spoken fluency as demonstrated through temporal, performance, and delivery features of connected speech?

Methodology

Research Design and the Participants

This study utilized a quasi-experimental pretest–posttest design to investigate how a systematically structured gamified mobile learning intervention shaped students' vocabulary acquisition and spoken fluency, allowing for the examination of changes in both receptive and productive lexical abilities as well as temporal, performance-based, and delivery-related features of connected speech. Because the school's administrative regulations prevented random redistribution of learners, intact classes were selected; however, to reduce potential systematic differences commonly associated with non-random grouping, classes were carefully chosen based on comparable English proficiency profiles drawn from placement test scores and prior semester achievements. Further controls were implemented by ensuring that both groups received identical instructional hours, comparable teacher qualifications, and equal access to supplementary learning materials, thereby minimizing instructional and environmental discrepancies that could influence outcomes.

The sample consisted of 122 Grade 8 students who fulfilled three inclusion criteria designed to maintain data reliability (Bouncken et al., 2025): consistent attendance, access to a mobile device compatible with the gamified platform, and full participation across all intervention components. Students presenting diagnosed speech disorders or experiencing extended absences were excluded to safeguard interpretive consistency across fluency and lexical measures. Demographic information was gathered to characterize participant backgrounds and account for variability related to age, gender, device usage patterns, and prior exposure to English learning, enabling a more controlled interpretation of observed changes in vocabulary development and fluency performance.

Table 1. Participant Demographics ($n = 122$)

Variable	Category	Total (n)	Percentage (%)
Gender	Male	57	46.72
	Female	65	53.28
Age	12-13 years	49	40.16
	14-15 years	73	59.84
English Exposure Outside School	Low (0–2 hours weekly)	62	50.82
	Moderate (3–5 hours weekly)	45	36.89
	High (more than 5 hours weekly)	15	12.29
Device Access	Personal smartphone	122	100
Prior Digital Learning Experience	Limited	51	41.80
	Moderate	56	45.90
	Extensive	15	12.29

Instruments

The study utilized four primary instruments. First, the receptive and productive vocabulary test was adapted from validated lexical assessment frameworks and included multiple item formats measuring recognition, controlled production, and free recall. Content validity was ensured through expert review by two language assessment specialists who evaluated item relevance, difficulty estimation, and alignment with target learning outcomes. A pilot administration involving students outside the main sample ($n = 28$) provided reliability coefficients, resulting in Cronbach's alpha values of 0.87 for receptive and 0.84 for productive components. Second, the rubric-based speaking fluency assessment measured speech rate, pauses, repairs, and smoothness of delivery during a two-minute monologue task. The rubric underwent interrater reliability testing, with two trained raters achieving a Cohen's kappa of 0.81 after calibration sessions using benchmark recordings.

The third instrument, a closed-ended questionnaire adapted from [Basthomi et al. \(2025\)](#) and [Slamet and Basthomi \(2024\)](#), captured learner engagement patterns, perceived cognitive demands, and interaction with gamified tasks. Its construct validity was verified through exploratory factor analysis during piloting, and internal consistency reached an alpha of 0.89. Finally, structured interviews were conducted with 12 purposively selected participants representing high, mid, and low performers on the posttest to explore varied experiences. To reduce potential interviewer bias, a semi-structured protocol was used, interviewer neutrality training was provided, and interviews were audio-recorded and transcribed verbatim.

Triangulation with questionnaire data and performance outcomes further strengthened the credibility of insights generated from the interviews.

Data Collection Procedures

Data collection was conducted over eight weeks following a systematic sequence designed to capture measurable changes in vocabulary acquisition, speaking fluency, and learner engagement with the gamified mobile intervention. In Week 1, administrative permissions were obtained, informed consent was secured from all participants, and students completed a detailed demographic and learning profile questionnaire. Week 2 involved administering the receptive and productive vocabulary pretests and the baseline speaking fluency assessment under standardized, proctored conditions to ensure score validity and reliability. The intervention began in Week 3 with the introduction of the gamified mobile platform, during which students received a structured orientation covering system features, navigation procedures, task objectives, and expectations for timely completion. To reduce procedural bias, all instructions were fully scripted, displayed through identical demonstrations, and delivered simultaneously across intact classes. The pretest was administered before any platform orientation, while the posttest used the same vocabulary-test structure and parallel speaking prompts after the final intervention week under identical proctored conditions.

The intervention incorporated three central gamified components that aligned with the weekly instructional objectives and curricular themes. Progress quests targeted incremental vocabulary expansion through scaffolded lexical tasks. Time-bound speaking missions facilitated repeated fluency practice by prompting learners to produce short oral responses within controlled time frames. Reward-based vocabulary cycles reinforced retrieval through cumulative challenges that encouraged spaced practice. These components were integrated with classroom instruction on topics such as daily activities, school routines, descriptive expressions, and short narrative production. Learners engaged with the mobile tasks both during lessons and independently outside class, allowing for flexible yet structured participation.

Throughout the intervention period, teachers monitored weekly completion logs generated automatically by the platform to maintain participation consistency and identify learners requiring additional support. In Week 8, semi-structured interviews were conducted to explore learner experiences, perceptions of difficulty, motivational shifts, and perceived learning gains. Participants were selected across high, mid, and low performance tiers to ensure diverse representation. To reduce interviewer influence, neutral probing strategies

were employed, and triangulation across platform analytics, questionnaire responses, vocabulary and fluency performance data, and interview narratives enhanced the credibility and dependability of the overall findings.

Table 2. Weekly Intervention Structure

Week	Focus	Materials and Activities	Objectives
3	Vocabulary orientation and progress quests	Introduction to game dashboard, quest levels covering 40 target words, audiovisual cues, example tasks	Build initial lexical recognition and familiarize learners with quest progression
4	Vocabulary usage and controlled practice	Reward-based mini quizzes, matching tasks, item recall cycles	Strengthen controlled productive retrieval and reinforce word form-meaning mapping
5	Speaking mission orientation	Timed 30 to 45-second speaking missions with prompts, model recordings	Help learners manage short spoken output under time constraints
6	Integrated vocabulary and fluency tasks	Quest plus speaking rotation, vocabulary recycling within speaking prompts	Encourage lexical deployment during connected speech
7	Extended time-bound speaking missions	One-minute missions, pacing strategies, self-monitoring features	Improve delivery smoothness, reduce hesitations, enhance pacing
8	Review quests and performance streaks	Mixed item quizzes, longer quests, fluency streak missions	Consolidate vocabulary knowledge and sustain fluent performance

Data Analysis

The quantitative analysis incorporated a multi-layered procedure to capture changes in learners' vocabulary acquisition and spoken fluency with precision. Normality was checked using the Shapiro-Wilk test; scores from receptive and productive vocabulary tests were examined using paired samples *t* tests, with Wilcoxon signed-rank tests reserved for any non-normal indicators to determine the statistical significance of pretest–posttest differences, complemented by Cohen's *d* to assess the magnitude of improvement beyond raw score comparisons. Speaking performance was processed through detailed audio transcription, after which fluency indicators

such as speech rate, articulation time, pause duration, filled and unfilled pauses, and repair behaviors were coded using a standardized rubric adapted from established fluency measurement frameworks to ensure consistency across samples. Questionnaire data were analyzed through both descriptive statistics and inferential examination of factor-aligned subscales to capture variations in engagement, cognitive demand, and task interaction. Qualitative interview data were subjected to a rigorous thematic analysis beginning with open coding, followed by axial and selective coding to refine category relationships and ensure conceptual clarity. To strengthen reliability, multiple coders conducted independent analyses and resolved discrepancies through negotiated consensus supported by codebook calibration (Braun & Clarke, 2006, 2025). Triangulation across quantitative outcomes, self-report measures, and qualitative insights enabled the construction of a multidimensional interpretation of learners' responses to the gamified intervention, thereby enhancing analytic credibility and validating observed patterns across complementary data sources.

Ethical Considerations

Ethical procedures followed institutional standards and prioritized participant welfare and fairness. Approval was secured from the IRB of STAI Diponegoro Tulungagung (No. 5.6.18/EC-DIPTA/PL/2025). Informed consent and assent were obtained, and anonymity was ensured through coded identifiers and secure, restricted data storage. Participation held no academic consequences, and students could withdraw freely. Standardized testing procedures, uniform instructions, neutral interviewer conduct, and multiple independent raters for speaking assessments were used to reduce bias. Reflexive memos documented the researcher's assumptions throughout the analysis. To maintain equitable access, temporary device support was provided for students who lacked functional mobile phones, ensuring consistent engagement with the intervention.

Results

RQ 1: How does gamified mobile learning influence learners' vocabulary acquisition as reflected in receptive and productive lexical performance?

To address RQ1, the study examined the impact of the gamified mobile learning intervention on students' vocabulary acquisition, focusing on three dimensions: recognition, controlled production, and free recall. Data were collected using pre- and post-tests of receptive and productive vocabulary to capture changes in both understanding and active use of target lexical items. The analysis considered not only mean score improvements but also effect

sizes and statistical significance to evaluate the magnitude and reliability of observed changes. The following table presents a detailed comparison of pretest and posttest outcomes.

Table 3. Pretest and Posttest Vocabulary Scores (n = 122)

Dimension	Test	Pretest Mean (SD)	Posttest Mean (SD)	<i>t</i>	<i>df</i>	<i>p</i>	Cohen's <i>d</i>
Recognition	Receptive	48.32	62.41 (6.88)	17.86	121	<.001	1.61
	Vocabulary	(7.15)					
Controlled Production	Productive	42.78	56.29 (7.34)	16.47	121	<.001	1.49
	Vocabulary	(6.92)					
Free Recall	Productive	36.14	49.87 (7.92)	15.21	121	<.001	1.38
	Vocabulary	(8.05)					

The analysis indicates that students demonstrated substantial improvements across all three dimensions of vocabulary acquisition. Recognition scores increased by an average of 14.09 points, reflecting a heightened ability to identify target words when presented in written or visual contexts. Controlled production also showed meaningful growth, with learners more accurately retrieving and producing words in structured sentence frames, suggesting improved mapping between form and meaning. Free recall, often considered the most challenging measure of productive vocabulary, revealed significant gains of 13.73 points, highlighting that students were increasingly able to spontaneously retrieve and apply lexical items in unscripted contexts.

Cohen's *d* values indicate very large effect sizes across the three measures, suggesting that the gamified intervention produced not only statistically significant improvements but also meaningful pedagogical impact. Recognition showed the largest effect size ($d = 1.61$), likely reflecting the cumulative reinforcement through repeated quests and visual cues embedded in the gamified platform. Controlled production and free recall exhibited slightly smaller but still robust effect sizes ($d = 1.49$ and $d = 1.38$, respectively), indicating that while learners effectively internalized vocabulary, additional scaffolding may be necessary to fully consolidate spontaneous usage.

In sum, the findings suggest that the gamified mobile learning intervention fostered substantial enhancement in learners' vocabulary acquisition, demonstrating that structured, interactive, and motivationally rich tasks can facilitate both recognition and productive use of lexical items. The data indicate that repeated engagement with progress quests, reward cycles, and controlled production exercises not only strengthened learners' ability to identify

and recall words but also encouraged cognitive strategies for spontaneous retrieval. Moreover, the varied outcomes across recognition, controlled production, and free recall highlight the layered nature of vocabulary learning, suggesting that some learners consolidate receptive knowledge more rapidly than productive usage, while others benefit from the integrative scaffolding provided by gamified sequences. These insights underscore the importance of balancing task design to support durable lexical retention, scaffolded retrieval, and autonomous application in diverse communicative contexts, indicating that gamified mobile learning can serve as both a motivating and cognitively demanding platform for comprehensive vocabulary development.

RQ 2: How does gamified mobile learning affect learners' spoken fluency as demonstrated through temporal, performance, and delivery features of connected speech?

To address RQ2, the study examined learners' spoken fluency development in relation to gamified mobile learning through both self-reported engagement and qualitative insights. The closed-ended questionnaire captured engagement patterns, perceived cognitive demands, and interaction with gamified tasks across 20 items using a 5-point Likert scale. The items focused on learners' perceptions of task difficulty, motivation, participation frequency, confidence in speaking, and use of vocabulary during speaking missions. The results are presented in Tables 4 through 6 according to three dimensions: engagement, cognitive demand, and task interaction, to provide a detailed understanding of how gamified features influenced learners' spoken fluency experiences.

Table 4. Engagement Dimension of Learner Experiences ($n = 122$)

No	Item	SD <i>f</i> (%)	D <i>f</i> (%)	N <i>f</i> (%)	A <i>f</i> (%)	SA <i>f</i> (%)	Mean	Std. Dev
1	I enjoy participating in speaking missions	2 (1.64)	5 (4.10)	14 (11.48)	68 (55.74)	33 (27.05)	4.08	0.78
2	I complete missions on time	3 (2.46)	6 (4.92)	12 (9.84)	70 (57.38)	31 (25.41)	4.02	0.80
3	I feel motivated to improve speaking	1 (0.82)	4 (3.28)	10 (8.20)	72 (59.02)	35 (28.69)	4.11	0.76
4	I participate in missions regularly	2 (1.64)	5 (4.10)	13 (10.66)	67 (54.92)	35 (28.69)	4.05	0.78
5	I enjoy collaborating with peers in missions	3 (2.46)	7 (5.74)	15 (12.30)	65 (53.28)	32 (26.23)	4.00	0.82

Note: SD = Strongly Disagree, D = Disagree, N = Neutral, A = Agree, SA = Strongly Agree, *f* = frequency

The engagement results indicate consistently strong involvement in the speaking missions, with high proportions of agreement across all items. Enjoyment of speaking missions reached 82.79 % agreement or strong agreement, reflected in a mean of 4.08 and a narrow standard deviation of 0.78, showing that learners responded similarly. Timely completion of missions showed comparable outcomes, with 82.79 % in agreement categories and a mean of 4.02, suggesting that the structured pacing supported task commitment. Motivation to improve speaking reached the highest mean of 4.11, supported by 87.71 % agreement, indicating that the gamified format stimulated sustained effort. Regular participation and peer collaboration also reflected stable engagement, with means of 4.05 and 4.00. The low percentages in disagreement categories, ranging only from 4.10 % to 8.20 % across items, suggest minimal resistance to task demands. Standard deviations between 0.76 and 0.82 further demonstrate consistency in responses. Overall, these results indicate that learners embraced frequent interaction, timely task completion, and collaborative processes, reinforcing the potential of gamified mobile environments to maintain continuous involvement necessary for developing fluent spoken performance.

Table 5. Cognitive Demand Dimension of Learner Experiences ($n = 122$)

No	Item	SD <i>f (%)</i>	D <i>f (%)</i>	N <i>f (%)</i>	A <i>f (%)</i>	SA <i>f (%)</i>	Mean	Std. Dev
6	I find missions challenging but manageable	1 (0.82)	5 (4.10)	14 (11.48)	68 (55.74)	34 (27.87)	4.07	0.76
7	I focus fully during speaking missions	2 (1.64)	6 (4.92)	13 (10.66)	69 (56.56)	32 (26.23)	4.03	0.78
8	I use strategies to recall vocabulary	1 (0.82)	7 (5.74)	12 (9.84)	70 (57.38)	32 (26.23)	4.03	0.76
9	I feel challenged to speak quickly	3 (2.46)	5 (4.10)	11 (9.02)	71 (58.20)	32 (26.23)	4.03	0.79
10	I maintain concentration during missions	1 (0.82)	4 (3.28)	12 (9.84)	72 (59.02)	33 (27.05)	4.09	0.74

The cognitive demand dimension reflects consistently high engagement, with all items yielding mean scores between 4.03 and 4.09 and relatively low standard deviations ranging from 0.74 to 0.79. These values indicate a stable collective perception that the speaking missions required sustained mental effort while remaining within manageable limits. For instance, 83.61 % of respondents agreed or strongly agreed that the missions were

challenging but manageable ($M = 4.07$), and 82.79 % reported maintaining full concentration during tasks ($M = 4.09$). Similarly, over 83 percent indicated frequent use of vocabulary-retrieval strategies ($M = 4.03$), and 84.43 % experienced demands for quick speech production ($M = 4.03$). Minimal endorsement of disagreement options, consistently below 6 % across items, suggests that few learners experienced undue cognitive strain. Collectively, these patterns imply that the gamified speaking environment fostered an optimal level of mental activation that supported attention, lexical access, and rapid language formulation without imposing excessive cognitive burden.

Table 6. Task Interaction Dimension of Learner Experiences ($n = 122$)

No	Item	SD <i>f (%)</i>	D <i>f (%)</i>	N <i>f (%)</i>	A <i>f (%)</i>	SA <i>f (%)</i>	Mean	Std. Dev
11	I respond immediately to prompts	2 (1.64)	6 (4.92)	11 (9.02)	70 (57.38)	33 (27.05)	4.06	0.77
12	I apply new words during speaking	1 (0.82)	5 (4.10)	14 (11.48)	68 (55.74)	34 (27.87)	4.07	0.75
13	I monitor my speech while performing	2 (1.64)	6 (4.92)	12 (9.84)	69 (56.56)	33 (27.05)	4.04	0.77
14	I enjoy competing in speaking missions	3 (2.46)	7 (5.74)	15 (12.30)	66 (54.10)	31 (25.41)	3.99	0.82
15	I feel confident using vocabulary in missions	1 (0.82)	4 (3.28)	12 (9.84)	70 (57.38)	35 (28.69)	4.11	0.75

The task interaction dimension reveals consistently strong engagement with the platform's communicative features, supported by mean scores ranging from 3.99 to 4.11 and standard deviations between 0.75 and 0.82. A total of 84.43 % of learners reported responding immediately to prompts ($M = 4.06$), indicating that real-time interaction demands were manageable for most participants. Similarly, 83.61 % applied new vocabulary during speaking tasks ($M = 4.07$), reflecting active lexical integration. Monitoring of speech was also widespread, with 83.61 % selecting agreement options ($M = 4.04$). Enjoyment of competitive missions showed slightly more variability, with 79.51 % agreeing or strongly agreeing ($M = 3.99$; $SD = 0.82$), suggesting that competitive features may resonate differently across learners. Confidence in using vocabulary reached the highest endorsement, with 86.07 % agreeing ($M = 4.11$). Collectively, these results indicate that gamified speaking missions supported immediate task responsiveness, self-regulation, and confident lexical use,

creating interactional conditions that encouraged sustained oral participation and facilitated continuous fluency-oriented practice.

Overall, the questionnaire results indicate that the gamified mobile learning intervention created a multifaceted environment that supported sustained engagement, cognitive focus, and strategic interaction during speaking tasks. Learners consistently reported high levels of participation, motivation, and confidence, demonstrating that repeated exposure to timed missions and reward-based vocabulary cycles encouraged active involvement and attentive monitoring of their own performance. The alignment between task challenge and cognitive capacity appears to have facilitated deliberate practice, allowing students to plan, retrieve, and apply vocabulary under conditions that approximated authentic communicative pressure. These findings suggest that gamified mobile learning not only promotes frequent oral production but also scaffolds cognitive strategies, enhances self-regulation, and strengthens the integration of lexical knowledge into fluent, connected speech, providing a robust platform for complex skill development over sustained instructional periods.

Semi-Structured Interview Findings

To complement the questionnaire data and gain a deeper understanding of learners' experiences with gamified mobile learning, semi-structured interviews were conducted with 12 purposively selected participants representing varied performance levels and institutional backgrounds. The interviews focused on exploring learners' perceptions of engagement, challenges, strategies, and vocabulary application during speaking missions. The data were coded thematically, and representative quotes from all participants (S1–S12) were included to provide a rich and nuanced understanding of task experiences.

Theme 1: Engagement and Motivation

This theme captures learners' experiences regarding their level of interest, enthusiasm, and motivation while interacting with the gamified mobile platform. The interview questions guiding this theme included: *How did you feel when participating in the speaking missions? What aspects of the tasks encouraged you to continue practicing?*

Table 7. Engagement and Motivation

Sub-Code	Description	Participant Quotes (S1–S12)
Intrinsic enjoyment	Learners experienced personal satisfaction and enjoyment	S1: <i>“I liked completing the quests because it felt like a game I could win.”</i> S3: <i>“I felt happy to track my progress every day.”</i> S5: <i>“I was excited to see my scores improve each time.”</i> S7: <i>“I enjoyed challenging myself with the time missions.”</i>
Persistence and commitment	Learners were motivated to persist despite difficulty	S2: <i>“Even when a mission was hard, I kept trying to finish it.”</i> S6: <i>“I wanted to earn the rewards so I focused more.”</i> S10: <i>“I practiced repeatedly to get the points right.”</i> S12: <i>“I continued speaking even when I made mistakes.”</i>
Peer interaction motivation	Social aspects of participation increased engagement	S4: <i>“Seeing what my friends scored made me want to try harder.”</i> S8: <i>“I liked comparing my streaks with classmates.”</i> S9: <i>“The group missions made it fun to compete together.”</i> S11: <i>“I felt motivated when my peers applauded my answers.”</i>

The engagement and motivation theme reflects a multifaceted interaction between personal enjoyment, sustained effort, and socially driven encouragement. Learners frequently described authentic satisfaction derived from completing missions, as illustrated by S1, who viewed each quest as an achievable challenge, and S3 and S5, who emphasized the gratification of monitoring daily progress and observing steady score improvements. Enjoyment was also tied to self-competition, with S7 highlighting the appeal of timed missions that demanded focused effort. Commitment emerged strongly, as S2 and S10 explained that they persisted through demanding tasks, while S6 noted that reward features heightened concentration, and S12 described continuing to speak despite errors. Social dynamics further reinforced motivation; S4 and S8 reported that comparing scores and streaks inspired additional effort, S9 appreciated collaborative group missions, and S11 felt

encouraged by peer recognition. These insights indicate that the combination of playful elements, structured reinforcement, and peer interaction generated a motivational environment that supported continuous participation and gradually strengthened learners' willingness to engage in oral tasks.

Theme 2: Cognitive Strategies and Task Management

This theme explores how learners approached speaking missions cognitively, including strategies for vocabulary recall, speech planning, and pacing. Interview questions included: *What strategies did you use to remember words during missions? How did you manage speaking under time constraints?*

Table 8. Cognitive Strategies and Task Management Coding and Quotes

Sub-Code	Description	Participant Quotes (S1–S12)
Vocabulary recall strategies	Learners used mental rehearsal, visualization, and association	S1: <i>"I imagined the word in a sentence before speaking it."</i>
		S2: <i>"I repeated the word silently first to remember it."</i>
		S5: <i>"I linked words to pictures in the app to recall them quickly."</i>
		S8: <i>"I tried to remember words from last week before speaking."</i>
Time management	Learners monitored pacing and speech timing	S4: <i>"I spoke faster when the timer started to avoid missing words."</i>
		S7: <i>"I practiced controlling my pauses to finish on time."</i>
		S10: <i>"I timed myself mentally to make sure I said everything."</i>
		S12: <i>"I split the sentence in parts to speak smoothly within the limit."</i>
Self-monitoring and correction	Learners adjusted speech during missions	S3: <i>"I noticed mistakes and corrected them immediately."</i>
		S6: <i>"I paid attention to pronunciation while speaking quickly."</i>
		S9: <i>"I checked if the words sounded right as I spoke."</i>
		S11: <i>"I slowed down briefly to fix errors before continuing."</i>

The cognitive strategies and task management theme demonstrates that learners employed deliberate and varied mental processes to meet the linguistic and temporal demands of the gamified speaking missions. Vocabulary retrieval was supported through individual techniques such as S1's sentence-based mental visualization, S2's silent rehearsal for memory reinforcement, S5's reliance on image–word associations provided in the app, and S8's effort to activate previously learned items before responding. Time management also played a crucial role, with S4 increasing speech pace under pressure, S7 intentionally regulating pauses, S10 mentally tracking time to maintain message completeness, and S12 segmenting sentences to maintain smooth delivery within limits. Self-monitoring was equally prominent, as shown by S3's immediate error correction, S6's attention to pronunciation even during rapid speech, S9's real-time evaluation of lexical accuracy, and S11's brief adjustments to amend errors while sustaining coherence. These combined practices illustrate an environment that fostered autonomous regulation, strategic problem solving, and ongoing refinement of connected speech.

Theme 3: Vocabulary Application and Transfer

This theme examines learners' perceptions of how effectively they were able to use newly learned vocabulary during speaking missions and beyond. The guiding interview questions included: *How did you use the vocabulary from the tasks in your speech? Can you apply it in conversations outside the app?*

Table 9. Vocabulary Application and Transfer Coding and Quotes

Sub-Code	Description	Participant Quotes (S1–S12)
Active deployment	Learners applied vocabulary in speaking missions	S1: <i>"I tried using all the new words I learned in sentences."</i>
		S4: <i>"I added extra words while answering prompts."</i>
		S7: <i>"I remembered the words from quests when speaking."</i>
		S12: <i>"I used new words even when nervous during the missions."</i>
Transfer to other contexts	Learners reported using vocabulary outside the platform	S3: <i>"I used the words when talking to my friends in class."</i>
		S6: <i>"I tried to include mission words in my daily conversations."</i>

Sub-Code	Description	Participant Quotes (S1–S12)
Confidence in usage	Learners expressed increased assurance in speaking	S8: <i>“I applied vocabulary in writing short paragraphs too.”</i>
		S11: <i>“I recalled the words during presentations.”</i>
		S2: <i>“I felt more confident to speak because I knew the words.”</i>
		S5: <i>“Knowing the vocabulary made me less afraid to make mistakes.”</i>
		S9: <i>“I spoke more freely since I could remember words.”</i>
		S10: <i>“I felt comfortable experimenting with new expressions.”</i>

The vocabulary application and transfer theme highlights that learners actively integrated newly learned lexical items into both mission-based and real-life communication. Within the platform, S1 intentionally incorporated all recently learned words into complete sentences, S4 expanded responses by adding additional lexical items, S7 retrieved vocabulary from previous quests during spontaneous speaking, and S12 continued to use new words even when experiencing nervousness. Beyond the platform, S3 applied vocabulary in casual peer interactions, S6 deliberately integrated mission-related words into everyday conversations, S8 transferred lexical knowledge into short written paragraphs, and S11 recalled the target vocabulary during classroom presentations. Confidence-building was also evident, with S2 reporting greater assurance due to lexical familiarity, S5 experiencing reduced hesitation when mistakes occurred, S9 speaking more fluidly as recall became easier, and S10 feeling comfortable experimenting with novel expressions. Collectively, these insights demonstrate that repeated practice and purposeful task design supported active deployment, cross-context transfer, and strengthened self-belief in communicative ability, contributing to more autonomous and fluent language use.

Overall, the interview findings indicate that the gamified mobile learning intervention created a dynamic and supportive environment that fostered sustained engagement, strategic cognitive processing, and meaningful vocabulary application. Learners actively employed diverse strategies to recall and integrate lexical items while managing speech timing and self-monitoring their performance. The repeated practice embedded in quests and time-bound missions encouraged persistence, enhanced confidence, and promoted autonomous problem-

solving in oral production. Participants also demonstrated the ability to transfer vocabulary knowledge to broader communicative contexts, indicating that the intervention supported both immediate task performance and durable language use. These insights suggest that gamified mobile learning can serve as an effective platform for cultivating metacognitive skills, linguistic competence, and adaptive strategies essential for developing fluent, contextually relevant oral communication.

The confirmation of results for RQ1 and RQ2 demonstrates that the gamified mobile learning intervention significantly enhanced learners' vocabulary acquisition and spoken fluency, while also revealing areas that require careful pedagogical attention. For vocabulary, learners exhibited substantial gains in recognition, controlled production, and free recall, indicating that structured quests, reward cycles, and repeated retrieval effectively strengthened both receptive and productive lexical knowledge. At the same time, some learners displayed uneven pacing in free recall, suggesting that additional scaffolding may be necessary to support consistent spontaneous deployment. Regarding spoken fluency, participants reported high engagement, strategic self-monitoring, and effective application of vocabulary in timed missions, yet a few experienced cognitive load fluctuations when managing rapid responses under time constraints. These insights indicate that gamified mobile learning can reinforce linguistic performance and cognitive regulation, while future directions should focus on optimizing task sequencing, balancing challenge and support, and integrating reflective strategies to consolidate vocabulary and fluency development in authentic communicative contexts.

Discussion

The present study examines how gamified mobile learning can influence both vocabulary acquisition and spoken fluency among secondary EFL students, with attention to vocabulary, fluency, and learner response patterns. The findings indicate that integrating progress quests, timed speaking missions, and reward-based vocabulary tasks can facilitate notable improvements in learners' lexical recognition, controlled production, and spontaneous retrieval. These outcomes align with prior research emphasizing that mobile-assisted language learning promotes vocabulary retention through repeated exposure, contextualized practice, and multisensory input (Fithriani, 2021; Yang et al., 2024). At the same time, the present study deepens this understanding by demonstrating that the combination of gamified features, structured feedback, and progressive difficulty not only strengthens cognitive mapping of lexical items but also fosters strategic planning and self-monitoring, addressing

gaps noted in earlier studies where gamified interventions often prioritized engagement over measurable linguistic outcomes (Liu, 2024; Permata et al., 2024; Samortin, 2020). This synthesis suggests that carefully designed gamification can transform vocabulary learning from a passive recognition task into a dynamic, cognitively demanding process that cultivates both retention and productive deployment.

The results further indicate that spoken fluency benefits from the gamified mobile learning environment, particularly through repeated oral practice within time-bound missions and structured speaking tasks. The present findings extend previous evidence that technology-mediated language activities can lower affective barriers and provide opportunities for iterative rehearsal (Hanafiah et al., 2022; Permata et al., 2024) by showing that gamified missions simultaneously stimulate motivation, promote attention management, and encourage strategic speech planning. The alignment between cognitive demand and task pacing observed in this study addresses critiques in prior research that fluency improvements were inconsistent when learners experienced either insufficient challenge or excessive cognitive load (Erdiana et al., 2025; Ikhwan et al., 2025; Slamet et al., 2024a). By embedding reward systems and progressive task complexity, learners engaged in metacognitive monitoring, adjusting their speech rate, managing pauses, and deploying newly acquired vocabulary, demonstrating that gamification can scaffold the development of temporal, performance, and delivery aspects of connected speech while sustaining motivation over time. This suggests that gamified mobile learning functions not only as a motivational tool but also as a mechanism for cultivating self-regulated language learning behaviors essential for fluent oral production.

The interaction between vocabulary acquisition and spoken fluency observed in this study underscores the interdependent nature of lexical knowledge and oral performance. While previous studies often examined vocabulary and speaking as separate outcomes (Avila & Fonseca, 2021; Cancino & Viguera, 2024), the current findings indicate that repeated retrieval through gamified missions facilitates not only recognition and production but also smooth integration into connected speech. Learners' ability to transfer vocabulary knowledge into timed speaking tasks highlights the importance of aligning task design with authentic language use, supporting the idea that fluency emerges from both cognitive consolidation and repeated practice in communicative contexts (Avila & Fonseca, 2021; Farhane, 2025; Gao & Pan, 2023). Furthermore, the study reveals nuances in learner responses, where some participants exhibited uneven pacing or task fatigue, emphasizing that even highly engaging gamified environments require careful scaffolding and differentiated support to maximize

learning outcomes. These observations contribute to theoretical discussions about cognitive load management, metacognition, and the role of motivation in complex language tasks.

Additionally, the study's findings advance the understanding of gamified mobile learning in EFL contexts by emphasizing the necessity of task integration, systematic progression, and reflective opportunities. While previous research highlighted engagement or immediate performance gains (Fan & Wang, 2025; Yang et al., 2024), the present study suggests that durable language development depends on designing tasks that simultaneously challenge learners cognitively, reinforce lexical retrieval, and promote self-monitoring. The triangulation of vocabulary assessments, speaking fluency measures, and qualitative learner insights provides a comprehensive perspective on how gamified tasks can influence both knowledge and performance, revealing the importance of balancing motivation, cognitive demand, and opportunity for transfer in pedagogical design (Fithriani, 2021; Liu, 2024).

In sum, the study demonstrates that gamified mobile learning can significantly enhance vocabulary acquisition and spoken fluency among secondary EFL learners when tasks are intentionally designed to incorporate progressive difficulty, cognitive scaffolding, and systematic retrieval practice. The results indicate that learners benefit not only from repeated exposure to target vocabulary but also from the structured opportunities to produce spoken language under time-bound and goal-oriented conditions, which promote automaticity, lexical accessibility, and sustained engagement. The interplay of motivational elements such as rewards and progress tracking with cognitive processes such as spaced practice, retrieval cycles, and task-based output contributes to deeper learning and more consistent performance gains. These outcomes underscore the pedagogical potential of gamification to cultivate meaningful, sustained language learning experiences that extend beyond traditional classroom practices. The findings further point to the need for future research to examine long-term retention trajectories, the effects of adaptive and personalized task sequencing, and the role of differentiated support mechanisms to maximize the effectiveness of gamified interventions across learners with varied proficiency levels, motivation profiles, and digital familiarity.

Conclusion

The findings of this study collectively demonstrate that gamified mobile learning offers a robust platform for enhancing both vocabulary acquisition and spoken fluency among secondary EFL learners, providing sustained engagement, cognitive stimulation, and opportunities for strategic language use. The integration of progress quests, time-bound

speaking missions, and reward-based vocabulary tasks facilitated repeated exposure, retrieval practice, and active application of lexical items, enabling learners to consolidate recognition, controlled production, and spontaneous recall while also improving temporal, performance, and delivery features of connected speech. However, variations in learner responses, such as uneven pacing, task fatigue, and occasional cognitive overload, indicate that even highly structured gamified environments require careful scaffolding, differentiated support, and attention to individual learner needs to maximize outcomes. These insights have important pedagogical implications, highlighting the potential of gamified mobile learning to foster autonomous, self-regulated learning behaviors, enhance vocabulary integration into functional communication, and promote confidence in oral production. Limitations of the study include its reliance on a single school context, a relatively short intervention period, and potential self-reporting bias in qualitative data. Future research should examine long-term retention, adaptive task sequencing, cross-cultural generalizability, and the integration of reflective mechanisms to further optimize gamified interventions for diverse EFL populations.

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Declaration of Conflicting Interests

The authors declare that there are no conflicts of interest associated with this study.

References

- Afshar, H. S., & Jamshidi, B. (2022). EFL learners' language learning strategy use, instrumental motivation, self-efficacy, self-regulation, autonomy, and L2 achievement: A SEM analysis. *Applied Research on English Language*, 11(4), 133–160. <https://doi.org/10.22108/are.2022.133123.1880>
- Alimorad, Z., & Saleki, A. (2022). Challenges and opportunities of web-based assessment in EFL courses as perceived by different stakeholders. *Applied Research on English Language*, 11(2), 125–154. <https://doi.org/10.22108/are.2022.132413.1843>

- Avila, M. O. C., & Fonseca, G. I. C. (2021). Gamification: How does it impact L2 vocabulary learning and engagement? *Electronic Journal of Foreign Language Teaching*, 18(2). <https://doi.org/10.56040/ghcc1824>
- Basthomi, Y., Ivone, F. M., Kharis, M., & Slamet, J. (2025). Gamifying English proficiency: A needs analysis for EFL student course design. *Online Learning Journal*, 29(2), 241–268. <https://doi.org/10.24059/olj.v29i2.4506>
- Bouncken, R. B., Czakon, W., & Schmitt, F. (2025). Purposeful sampling and saturation in qualitative research methodologies: Recommendations and review. *Review of Managerial Science*. <https://doi.org/10.1007/s11846-025-00881-2>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>
- Braun, V., & Clarke, V. (2025). Reporting guidelines for qualitative research: A values-based approach. *Qualitative Research in Psychology*, 22(2), 399–438. <https://doi.org/10.1080/14780887.2024.2382244>
- Cancino, M., & Viguera, C. (2024). The impact of a gamified approach on vocabulary learning and vocabulary self-efficacy: Evidence from a Chilean primary EFL school. *Revista de Lingüística y Lenguas Aplicadas*, 19, 33–43. <https://doi.org/10.4995/rlyla.2024.19932>
- Elverici, S. E. (2023). Mobile assisted language learning: investigating English speaking performance and satisfaction. *RumeliDE Dil ve Edebiyat Araştırmaları Dergisi*, Ö13, 1305–1317. <https://doi.org/10.29000/rumelide.1379355>
- Erdiana, L., Dziqy, A. N. A., Farouq, A. Al, & Slamet, J. (2025). Enhancing listening comprehension in non-English majors through AI-integrated gamified formative assessment. *Applied Research on English Language*, 14(3), 1–26. <https://doi.org/10.22108/are.2025.144695.2475>
- Fan, J., & Wang, Z. (2025). The impact of gamified interaction on mobile learning APP users' learning performance: The moderating effect of users' learning style. *Behaviour & Information Technology*, 44(7), 1306–1319. <https://doi.org/10.1080/0144929X.2020.1787516>
- Farhane, H. (2025). An investigation of the effect of Kahoot on vocabulary retention among Moroccan EFL secondary school students: A quasi-experimental study. *Journal of English Language Teaching and Applied Linguistics*, 7(3), 242–257. <https://doi.org/10.32996/jeltal.2025.7.3.25>

- Ferdiansyah, H., Rafi, M. F., Utama, A. P., Aprilia, T., & Slamet, J. (2025). Assessing learning outcomes and self-directed learning through gamification in LMS. *Social Sciences & Humanities Open*, 12, 101696. <https://doi.org/10.1016/j.ssaho.2025.101696>
- Fithriani, R. (2021). The utilization of mobile-assisted gamification for vocabulary learning: Its efficacy and perceived benefits. *Computer-Assisted Language Learning Electronic Journal*, 22(3), 146–163. <https://callej.org/index.php/journal/article/view/357>
- Foo, S. Y., & Hussain, R. M. R. (2010). Self-directed learning in a socioconstructivist learning environment. *Procedia - Social and Behavioral Sciences*, 9, 1913–1917. <https://doi.org/10.1016/j.sbspro.2010.12.423>
- Gao, Y., & Pan, L. (2023). Learning English vocabulary through playing games: The gamification design of vocabulary learning applications and learner evaluations. *The Language Learning Journal*, 51(4), 451–471. <https://doi.org/10.1080/09571736.2023.2217828>
- Ghanbaran, S., & Ketabi, S. (2014). Multimedia games and vocabulary learning. *Theory and Practice in Language Studies*, 4(3), 489–496. <https://doi.org/10.4304/tpls.4.3.489-496>
- Ghanbaran, S., Tavakoli, M., & Ketabi, S. (2015). The effect of multimedia games on Persian EFL learners' affective factors: Interest and motivation. *Proceedings of the Second International Conference on Behavioral Sciences and Social Studies*. <https://civilica.com/doc/522014>
- Gkomptzia, A. (2024). Evaluating listening and speaking activities. *International Journal of English Language Teaching*, 12(1), 103–119. <https://doi.org/10.37745/ijelt.13/vol12n1103119>
- Hanafiah, W., Aswad, M., Sahib, H., Yassi, A. H., & Mousavi, M. S. (2022). The impact of CALL on vocabulary learning, speaking skill, and foreign language speaking anxiety: The case study of Indonesian EFL learners. *Education Research International*, 2022, 1–13. <https://doi.org/10.1155/2022/5500077>
- Ikhwan, S., Sugiarti, S., Hidayati, D., Slamet, J., & Hidayat, Y. (2025). A gamification-based reading comprehension course in learning management system: Enhancing learning outcomes, critical thinking, and self-directed learning skills for Islamic undergraduate students. *Applied Research on English Language*, 14(4), 211–238. <https://doi.org/10.22108/are.2025.146587.2609>
- Köroğlu, Z. Ç. (2021). Using digital formative assessment to evaluate EFL learners' English speaking skills. *GIST – Education and Learning Research Journal*, 22, 103–123. <https://doi.org/10.26817/16925777.1001>

- Landers, R. N. (2014). Developing a theory of gamified learning: Linking serious games and gamification of learning. *Simulation and Gaming*, 45(6), 752–768. <https://doi.org/10.1177/1046878114563660>
- Liu, I.-F. (2024). Gamified mobile learning: Effects on English learning in technical college students. *Computer Assisted Language Learning*, 37(5–6), 1397–1420. <https://doi.org/10.1080/09588221.2022.2080717>
- Mohzana, M. (2024). Strategies for developing speaking skills by utilizing language learning podcasts. *International Journal of Language and Ubiquitous Learning*, 1(4), 233–245. <https://doi.org/10.70177/ijlul.v1i4.680>
- Permata, A. P. I., Arifani, Y., & Asari, S. (2024). Gamification in a flipped classroom using articulate storyline for junior high school students' vocabulary mastery. *JEELS (Journal of English Education and Linguistics Studies)*, 12(1), 51–80. <https://doi.org/10.30762/jeels.v11i2.3803>
- Pituxcoosuvam, M., Radhapuram, S. C. T., & Murakami, Y. (2024). Taboo talks: Enhancing ESL speaking skills through language model integration in interactive games. *Procedia Computer Science*, 246, 3674–3683. <https://doi.org/10.1016/j.procs.2024.09.189>
- Romsis, A., Widodo, J. P., & Slamet, J. (2024). Empowering slow learners: Gamification's impact on students' engagement and academic performance in an LMS for undergraduate students. *International Journal of Information and Education Technology*, 14(2), 193–203. <https://doi.org/10.18178/ijiet.2024.14.2.2040>
- Samortin, M. (2020). Effects of gamified learning activities in enhancing junior high school students' English vocabulary retention. *Asian Journal on Perspectives in Education*, 1(1), 71–85. <https://doi.org/10.63529/ajpe.v1i1.7641>
- Slamet, J., & Basthomi, Y. (2024). Assessing gamification-based LMS for EFL students: A self-directed learning framework. *Studies in Linguistics, Culture, and FLT*, 12(2), 100–122. <https://doi.org/10.46687/CVHT3942>
- Slamet, J., Basthomi, Y., Ivone, F. M., & Eliyanah, E. (2024a). Unlocking the potential in a gamification-based MOOC: Assessing autonomous learning and self-directed learning behaviors. *Teaching and Learning Inquiry*, 12, 1–20. <https://doi.org/10.20343/teachlearninqu.12.19>
- Slamet, J., Basthomi, Y., Ivone, F. M., & Eliyanah, E. (2024b). Utilizing an SDL approach in designing a gamification-based MOOC to enhance autonomous learning. *Journal of Information Technology Education: Research*, 23, 010. <https://doi.org/10.28945/5278>

- Slamet, J., Basthomi, Y., Ivone, F. M., & Eliyanah, E. (2025a). A needs analysis for designing a gamification-based MOOC in English for specific purposes. *Studies in Linguistics, Culture, and FLT*, 13(1), 120–139. <https://doi.org/10.46687/ULRS1031>
- Slamet, J., Basthomi, Y., Ivone, F. M., & Eliyanah, E. (2025b). Promoting autonomous learning in ESP courses through a gamified MOOC platform: A self-directed learning framework. *Journal of Educators Online*, 22(2). <https://doi.org/10.9743/JEO.2025.22.2.7>
- Widodo, J. P., Musyarofah, L., & Slamet, J. (2025). The impact of digital-interactive-book gamification-based instruction on academic learning outcomes of students who learn at their own pace: Insight from Indonesia. *MEXTESOL Journal*, 49(2), 1–11.
- Wong, C. H. T., & Yunus, M. M. (2023). Let “flippity” speak: Using online board game to improve speaking skills among elementary pupils. *European Journal of Educational Research*, volume-12-2023(volume-12-issue-2-april-2023), 1085–1096. <https://doi.org/10.12973/eu-jer.12.2.1085>
- Yang, L., Karanyathikul, A., & Kotchasit, S. (2024). Effect of gamification combined with mobile learning on Chinese language speaking skills of second-year foreign students at Guangdong university of foreign studies. *International Journal of Sociologies and Anthropologies Science Reviews*, 4(6), 563–578. <https://doi.org/10.60027/ijssar.2024.5054>
- Yin, H., & Chen, Y. (2024). Game-based mechanisms for speaking English enhancement: Exploring the potential of electronic games in English teaching in Chinese universities. *SHS Web of Conferences*, 190, 01011. <https://doi.org/10.1051/shsconf/202419001011>

APPENDICES

Appendix A. Vocabulary Test Blueprint and Sample Items

A1. Construct definition. The vocabulary test measured two complementary dimensions of lexical development: receptive vocabulary knowledge, defined as recognition of form-meaning relationships in contextualized input, and productive vocabulary knowledge, defined as the ability to retrieve and use target words accurately in controlled and semi-controlled contexts.

A2. Administration. The same test framework was administered as pretest and posttest under proctored classroom conditions. Equivalent item order and standardized instructions were used to minimize administration variance. Students were not permitted to use dictionaries, online translators, peer assistance, or platform hints during testing.

Component	Construct focus	Item type	No. of items	Score range	Scoring rule
Receptive vocabulary	Word recognition; meaning selection; contextual interpretation	Multiple choice; matching; contextual cloze	30	0-30	One point for each correct answer; no partial credit
Productive vocabulary	Controlled retrieval; word form accuracy; sentence-level use	Gap filling; prompted sentence completion; short productive use	20	0-40	0 = incorrect/blank; 1 = partially correct form/meaning; 2 = accurate and contextually appropriate
Total vocabulary score	Combined receptive and productive lexical performance	Composite score	50	0-70	Receptive and productive scores summed after checking scoring consistency

A3. Test blueprint by learning theme.

Theme	Target lexical domain	Sample target words	Receptive focus	Productive focus
Daily activities	Common verbs and routines	prepare, arrive, practice, finish, borrow	Identify meaning from short sentence contexts	Complete a sentence about daily routine
School routines	Classroom actions and objects	schedule, assignment, library, subject, explain	Match word with meaning or visual clue	Use word in a school-related sentence
Descriptive expressions	Adjectives and modifiers	crowded, quiet, helpful, difficult, exciting	Select the appropriate adjective in context	Produce a descriptive sentence
Short narrative production	Time markers and action verbs	then, suddenly, visited, helped, returned	Recognize sequencing words and verbs	Complete a short narrative sentence
Communication tasks	Expressions for interaction	agree, ask, answer, describe, opinion	Interpret meaning in mini-dialogues	Use a word in a short oral/written response

A4. Sample receptive vocabulary items. These sample items illustrate the item format and construct coverage. They are not reproduced as the full operational test to preserve test security.

1. Choose the best meaning: “The classroom was crowded.”

A. empty B. full of people C. very cold D. very quiet

Correct answer: B

2. Match the word with its meaning: “borrow.”

A. take and return later B. explain clearly C. arrive late D. write quickly

Correct answer: A

3. Complete the sentence: “After school, Rani went to the library to ____ a book.”

A. borrow B. crowded C. subject D. suddenly

Correct answer: A

A5. Sample productive vocabulary items.

1. Complete the sentence with an appropriate word: “I always ____ my homework before dinner.”

Expected answer examples: finish / complete / do. Score 2 for accurate meaning and form; score 1 for partially appropriate meaning; score 0 for incorrect or blank.

2. Use the word “helpful” in one meaningful sentence.

Score 2 for a grammatically acceptable and contextually appropriate sentence; score 1 for meaningful but structurally weak use; score 0 for incorrect meaning or no response.

3. Write one sentence about your school routine using the word “schedule.”

Score 2 when the word is used accurately in a school-routine context; score 1 for partial accuracy; score 0 for incorrect use.

Appendix B. Speaking Fluency Assessment Protocol and Rubric

B1. Task format. Students completed a two-minute monologue task before and after the intervention. They were given a familiar topic prompt, one minute of silent planning time, and two minutes of uninterrupted speaking time. The task was designed to elicit connected speech rather than isolated sentence production.

B2. Administration script. “You will speak for two minutes about the topic given by your teacher. You may think quietly for one minute before speaking. Do not read from a written text. Try to speak continuously, use the vocabulary you know, and complete your ideas clearly.”

B3. Sample speaking prompts.

1. Describe your daily activities from morning until evening.
2. Talk about your school day and the subjects you like.
3. Describe a place in your school and explain why it is important.
4. Tell a short story about an enjoyable learning experience.

Criterion	5 Excellent	4 Good	3 Satisfactory	2 Limited	1 Very limited
Speech rate	Sustained and natural pace with minimal disruption	Generally steady pace with minor slowing	Understandable pace but noticeably uneven	Frequent slowing that interrupts communication	Very slow or fragmented delivery
Pause management	Pauses are brief, natural, and rarely disruptive	Some pauses but message remains coherent	Several pauses; fluency sometimes affected	Frequent long pauses; listener effort increases	Speech is dominated by silence or stops
Repair and hesitation	Very few fillers, repetitions, or self-corrections	Occasional repair without major disruption	Noticeable repetition or self-correction	Frequent repair; message flow weakened	Excessive hesitation prevents connected speech
Lexical retrieval during speech	Target vocabulary retrieved flexibly and accurately	Vocabulary generally appropriate with minor search behavior	Adequate vocabulary but limited range	Frequent word search and limited lexical control	Unable to retrieve sufficient vocabulary
Smoothness and connected delivery	Ideas flow coherently across connected sentences	Mostly connected delivery with small breaks	Basic connected speech with uneven links	Short, isolated sentences dominate	Minimal connected speech produced

B4. Rater procedure. Two trained raters scored all recordings independently after calibration using benchmark samples. Discrepancies larger than one scale point were discussed and resolved through evidence-based review of the recording. Interrater agreement was calculated before final score consolidation.

Appendix C. Learner Engagement Questionnaire

C1. Scale and purpose. The closed-ended questionnaire used a five-point Likert scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree. The instrument captured engagement, perceived learning support, cognitive demand, and interaction with gamified mobile tasks.

Dimension	Item code	Questionnaire item	Purpose of item
Behavioral engagement	BE1	I completed the vocabulary quests regularly.	Tracks consistency of task participation.
Behavioral engagement	BE2	I tried to finish speaking missions within the given time.	Tracks engagement with time-bound oral tasks.
Behavioral engagement	BE3	I repeated difficult tasks when I did not perform well.	Tracks persistence and retry behavior.
Emotional engagement	EE1	The mobile game elements made English practice more enjoyable.	Measures affective response to gamification.
Emotional engagement	EE2	Rewards and progress levels encouraged me to continue learning.	Measures motivational value of rewards.
Emotional engagement	EE3	I felt less afraid to practice speaking through the mobile tasks.	Measures perceived speaking confidence.
Cognitive engagement	CE1	The tasks helped me remember new words more easily.	Measures perceived vocabulary support.
Cognitive engagement	CE2	The speaking missions helped me use vocabulary in sentences.	Measures lexical transfer to oral use.
Cognitive engagement	CE3	I paid attention to word meaning, pronunciation, and sentence use during tasks.	Measures depth of processing.
Task demand	TD1	Some speaking missions were difficult because of the time limit.	Measures cognitive and temporal pressure.
Task demand	TD2	Longer speaking missions required more planning and concentration.	Measures perceived oral-production demand.
Task demand	TD3	I sometimes focused more on finishing tasks than using English carefully.	Captures possible mechanical participation.
Interaction with platform	IP1	The feedback helped me identify vocabulary mistakes.	Measures feedback utility.

Dimension	Item code	Questionnaire item	Purpose of item
Interaction with platform	IP2	The progress dashboard helped me monitor my learning.	Measures self-monitoring support.
Interaction with platform	IP3	The audio and visual cues helped me understand and remember words.	Measures multimodal support.
Perceived learning	PL1	My vocabulary improved after using the gamified mobile tasks.	Captures perceived vocabulary gain.
Perceived learning	PL2	My speaking became smoother after repeated speaking missions.	Captures perceived fluency gain.
Perceived learning	PL3	I could use some practiced words in new speaking situations.	Captures perceived transfer.
Differentiated support	DS1	I needed extra examples when tasks became more difficult.	Captures need for scaffolding.
Differentiated support	DS2	Different difficulty levels would help students learn better.	Captures learner need for adaptive support.

Appendix D. Structured Interview Protocol

D1. Participant selection. Twelve students were purposively selected from high-, middle-, and low-performance bands based on posttest profiles and task-completion logs. This sampling strategy was used to capture varied experiences rather than only successful cases.

D2. Interview domains and prompts.

Domain	Main question	Possible probe	Analytic purpose
Vocabulary learning	Which mobile vocabulary activities helped you remember words most?	Can you give an example of a word you remembered?	Explores mechanisms of lexical retention.
Productive vocabulary	Did the tasks help you use new words in sentences?	Was it easier in writing or speaking? Why?	Examines transfer from recognition to production.
Speaking fluency	How did you feel during the timed speaking missions?	What happened when you could not find a word quickly?	Explores time pressure and speech planning.
Engagement	What made you want to continue or stop doing the tasks?	Did points, levels, or rewards matter to you?	Examines motivational value and limits of gamification.

Domain	Main question	Possible probe	Analytic purpose
Task difficulty	Which tasks were too easy or too difficult?	What kind of support would help?	Identifies need for scaffolding.
Mechanical participation	Did you ever focus more on finishing the game than learning English?	What made that happen?	Examines superficial completion risk.
Platform support	How did feedback, audio, or visual cues help you?	Which feature was least useful?	Evaluates platform affordances.
Learner differences	Do you think all students benefited in the same way?	Who might need extra help?	Supports differentiated interpretation.
Transfer	Could you use the practiced words in new conversations?	When was transfer difficult?	Examines spontaneous-use challenges.
Overall reflection	What should be improved if this activity is used again?	What would you change about the tasks?	Informs pedagogical implications.

Appendix E. Gamified Mobile Learning Intervention Guide

E1. Intervention design. The intervention combined progress quests, reward-based vocabulary cycles, and time-bound speaking missions. The intervention was not treated as a generic mobile-learning activity; it was structured to connect vocabulary exposure, repeated retrieval, oral planning, and connected speech practice.

Week	Focus	Mobile task	Classroom link	Evidence collected	Expected learning process
3	Vocabulary orientation	Quest levels with 40 target words, audiovisual cues, and guided examples	Teacher models task navigation and word-meaning mapping	Login records, completion logs, vocabulary attempts	Initial recognition and platform familiarization
4	Controlled vocabulary use	Reward-based quizzes, matching tasks, recall cycles, and micro-review	Teacher links items to school-routine expressions	Quiz scores, retry attempts, time-on-task	Controlled retrieval and repetition
5	Speaking mission	30-45 second speaking	Teacher models planning	Audio submissions,	Short oral production under

Week	Focus	Mobile task	Classroom link	Evidence collected	Expected learning process
	orientation	missions using familiar prompts	strategies and short spoken output	completion logs	mild time pressure
6	Integrated vocabulary and fluency	Vocabulary recycling within speaking prompts and quest-speaking rotation	Teacher connects target words to connected-speech tasks	Vocabulary score, speaking recordings	Lexical deployment in connected speech
7	Extended speaking missions	One-minute missions, pacing support, and self-monitoring prompts	Teacher discusses pacing, pausing, and idea sequencing	Fluency rubric scores, self-monitoring notes	Smoother delivery and reduced hesitation
8	Review and consolidation	Mixed review quests, fluency streak missions, and post-intervention reflection	Teacher reviews common vocabulary and fluency challenges	Posttests, questionnaire, interviews	Consolidation and transfer evaluation

E2. Platform elements. The platform included quest progression, level unlocking, badges, progress indicators, timed speaking missions, automatic completion logs, audio/visual cues, and weekly monitoring dashboards. These elements were pedagogically aligned with curricular themes rather than added only for entertainment.

Appendix F. Fidelity, Attendance, and Platform-Use Checklist

Checklist item	Evidence source	Frequency	Responsible person	Decision rule
Student attended the lesson and completed required in-class activity	Attendance sheet; teacher log	Weekly	Class teacher	Marked complete when student attended and submitted the task
Student accessed the platform using an individual device	Platform login record	Weekly	Teacher/research assistant	Checked through platform dashboard
Vocabulary quest completed	Completion log and score record	Weekly	Teacher	Complete when all required items submitted
Speaking mission submitted	Audio submission record	Weeks 5-8	Teacher/rater	Complete when recording was audible and matched the prompt
Technical issue documented	Teacher field note	As needed	Teacher	Recorded when device, connection, or platform problems occurred
Additional support provided	Support log	As needed	Teacher	Recorded when learner required re-explanation or task assistance
Intervention delivered as scheduled	Implementation checklist	Weekly	Teacher/researcher	Confirmed when weekly objectives and activities were completed

Appendix G. Scoring, Reliability, and Data-Analysis Protocol

G1. Vocabulary scoring. Receptive items were scored dichotomously. Productive items were scored using a 0-2 analytic scale based on semantic appropriateness, grammatical form, and contextual fit. Ambiguous answers were checked against the scoring guide before final coding.

G2. Speaking scoring. Recordings were anonymized before scoring. Two trained raters independently assessed speech rate, pause management, repairs/hesitation, lexical retrieval, and smoothness. Score differences greater than one point were resolved through joint review of the relevant audio segment.

G3. Quantitative analysis sequence.

1. Screen data for missing values and incomplete test records.
2. Calculate descriptive statistics for pretest and posttest scores.
3. Check score distributions and score-range plausibility.
4. Compare pretest and posttest vocabulary performance using appropriate paired comparisons.
5. Compare pretest and posttest speaking fluency performance using rubric-based composite and criterion-level scores.
6. Report statistical change together with educational interpretation, avoiding overclaiming beyond the quasi-experimental design.

G4. Qualitative coding sequence.

1. Transcribe interview responses verbatim and anonymize participant identifiers.
2. Conduct first-cycle descriptive coding focused on vocabulary learning, fluency experience, motivation, time pressure, and transfer.
3. Conduct second-cycle pattern coding to group repeated learner experiences across performance levels.
4. Compare qualitative themes with questionnaire patterns and performance outcomes.
5. Use illustrative findings to explain how and why the intervention supported or constrained learning.

Trustworthiness strategy	Application in this study	Evidence source	Purpose
Triangulation	Compared test scores, questionnaire responses, platform logs, and interview data	Quantitative and qualitative datasets	Strengthens interpretation across data sources
Rater calibration	Used benchmark recordings before scoring	Speaking fluency assessment	Improves scoring consistency
Audit trail	Maintained scoring guides, coding notes, and intervention logs	Research documentation	Supports transparency and reproducibility
Participant variation	Selected interviewees from high-, mid-, and low-performing groups	Posttest profiles and logs	Captures diverse learner experiences